prepared a splendid and also unique outline of the "Proposed periods in the history of astronomy in America." Dr. Rufus showed clearly by six successive steps, or periods, how each developed and expanded into a "two-dimensional form," or system.

Beginning with the introductory period (1490–1600) he stated how astronomy played its part in early navigation and explorations. Following the colonial period (1600–1780) was the beginning of observational astronomy, dominated by John Winthrop and David Rittenhouse. Next was the apparent stationary period (1780–1830), the beginning of mathematical astronomy, established by Nathaniel Bowditch and Benjamin Peirce. Following this came the popular period (1830–1860), the beginning of practical astronomy and the rapid rise of college observatories. New astronomy (1860–1890) was the beginning of astrophysics—the study of the chemical and physical properties of the star light. The last is the contemporary or correlation period (1890–), the beginning of quantitative astrophysics.

In each of these six successive periods of course there is the overlapping in time—there is no clear demarcation setting off one period from another. Such an outline as presented by Dr. Rufus should form the basis of the history of the physical sciences in America. This paper is to appear in print in the course of a few months.

The last paper before the History of Science section was that by Dr. H. A. Bumstead, of the National Research Council and of Yale University. Dr. Bumstead presented the paper "The history of physics," which was one of a series of lectures on the History of Science given before the Yale faculty and students.

The history of experimental physics from the time of Newton to the present was given so ably and charmingly that one might almost say a standard of scholarly presentation of a scientific topic had been reached. Fortunately this paper also is to appear in one of the early numbers of the *Scientific Monthly*, and later to appear in book form. This marked the last public address of Dr. Bumstead, for on the followng day, en route to Washington, he died. The richness of Dr. Bumstead's singularly attractive personality, and the depth of his scholarship and culture have left an indelible mark on all those who have ever come in contact with him.

During the Wednesday session the election for officers of the section was held—and the following were accordingly elected:

For Vice-president: Dr. William A. Locy, Northwestern University.

For Sectional Committee: Dr. Florian Cajori, University of California; Dr. George Sarton, Carnegie Institution; Dr. Walter Libby, University of Pittsburgh; Dr. Louis C. Karpinski, University of Michigan.

For Secretary: Frederick E. Brasch, John Crerar Library, Chicago.

This holding of two conferences by two different organizations, marks the beginning of a new phase of scientific learning and scholarship in America.

In Europe much has been accomplished in the advancement of the History of Science studies, especially so in England. Oxford and Cambridge universities and University of London have recognized the cultural value and have established facilities for research work. Also, independent sections for the History of Science have been organized by the "Versammlung Deutscher Naturforscher und Aerzte," and by the "Società Italiana per il Progresso delle Scienze." The activity of the Italian historians of science is evidenced by the new publication—"Archivio di Storia della Scienza," edited by Aldo Micli; besides other historical publications that are appearing. And it is to be desired similar publications be encouraged and supported in this country. Therefore, it is to be hoped that through cooperation and coordination the History of Science movement, thus fostered and encouraged by the American Historical Association and the American Association for the Advancement of Science, can likewise aid in this "New Humanism." Frederick E. Brasch,

Secretary

THE OPTICAL SOCIETY OF AMERICA

The Optical Society of America was organized in 1916. As stated in its constitution, "It is the aim and purpose of this society to increase and diffuse the knowledge of optics, to promote the mutual interests of investigators of optical problems, of designers, manufacturers and users of optical instruments and apparatus of all kinds and to encourage cooperation among them." While the society pays especial attention to "applied" optics and, on this account, covers a field not previously covered, it is not to be regarded as a technological society in contradistinction to a society devoted to "pure" science. The aim of the society is to cover the field of optics, including "pure" optics as well as "optical engineering."

It solicits the support and membership of all persons "interested in optics" whatever their particular interest may be. The actual present scope of the society's activities will be best indicated by the contents of its journal and the program of its latest meeting given below.

The present membership of the society is about two hundred and twenty and is increasing rapidly. The officers for 1921 are:

President, J. P. C. Southall, Columbia University, New York City.

Vice-president, C. E. Mendenhall, University of Wisconsin, Madison, Wis.

Secretary, Irwin G. Priest, Bureau of Standards, Washington, D. C.

Treasurer, Adolph Lomb, Bausch & Lomb Optical Co., Rochester, N. Y.

Editor, Paul D. Foote, Bureau of Standards, Washington, D. C.

MEMBERS OF THE COUNCIL IN ADDITION TO ABOVE OFFICERS

Past-president (1920), F. K. Richtmyer, Cornell University, Ithaca, N. Y.

Elected Members at Large 1921: P. G. Nutting, Westinghouse Research Laboratory, East Pittsburgh, Pa.; C. E. K. Mees, Eastman Research Laboratory, Rochester, N. Y.; L. A. Jones, Eastman Research Laboratory, Rochester, N. Y.; W. E. Forsythe, Nela Research Laboratory, Nela Park, Cleveland, Ohio.

Recent meetings were held in New York February 26–27, 1920, and Chicago, December 27–29, 1920. The program of the Chicago meeting follows:

Courses in optics and optometry in Columbia University: JAMES P. C. SOUTHALL, Columbia University.

Thermal expansion of wires used in glass seals: C. G. PETERS and C. H. CRAGOE, Bureau of Standards.

Refractive index of glass through the annealing range: C. G. PETERS and C. H. CRAGOE, Bureau of Standards.

Notes on the theory of photographic spectrophotometers: E. D. TILLYER, American Optical Company.

A new ocular micrometer: HERMANN KELLNER, Bausch & Lomb Optical Co.

Presentation and Discussion of the Reports of the Committees on Nomenclature and Standards: P. G. NUTTING, General Chairman.

1. Colorimetry, L. T. Troland.
2. Lenses and Optical Instruments, J. P. C. Southall.
3. Optical Glasses, George W. Morey.
4. Photographic Materials, W. F. Meggers.
5. Photometry and Illumination, E. C. Crittenden.
6. Polarimetry, F. E. Wright.
7. Projection, L. A. Jones.
8. Pyrometry, W. E. Forsythe.
9. Reflectometry, A. H. Taylor.
10. Refractometry, C. A. Skinner.
11. Spectacle Lenses, E. D. Tillyer.
12. Spectrophotometry, A. H. Pfund.
13. Spectroradiometry, W. W. Coblentz.
14. Visual Sensitometry, Prentice Reeves.
15. Wave Lengths, W. F. Meggers.

(About half of the above reports were presented before the general meeting by title only.)

A comparison of monochromatic screens for optical pyrometry: W. E. FORSYTHE, Nela Research Laboratory.

An improved form of Pickering polarimeter for gloss measurements (by the polarization method): L. R. INGERSOLL, University of Wisconsin.

An unfamiliar anomaly of vision and its relation to certain optical instruments: W. B. RAYTON, Bausch & Lomb Optical Co.

Double refraction of glass tubing as indicating the strains present: A. Q. TOOL and C. G. EICHLIN, Bureau of Standards.

Monocular and binocular perception of contrast and brightness: PRENTICE REEVES, Eastman Kodak Company.

Systems of color standards: A. AMES, JR., Dartmouth College.

A new study of the leucoscope and its application to pyrometry. (Extension of work reported at N. Y., February, 1920): IRWIN G. PRIEST, Bureau of Standards.

Address of the retiring president of the Optical Society of America. *Some outstanding problems of physiological optics:* F. K. RICHTMYER, Cornell University.

Atmospheric corrections for the Harcourt Standard Pentane lamp: E. B. ROSA, E. C. CRITTENDEN, A. H. TAYLOR, Bureau of Standards.

Some major problems in photometry: E. C. CRITTENDEN and J. F. SKOGLAND, Bureau of Standards.

Comparative tests as to the accuracy of various methods for precision measurements of focal lengths (by title): W. O. LYTLE and A. K. BENNETT, Bureau of Standards.

The diffusion of light in a searchlight beam (by title): ENOCH KARRER and U. M. SMITH, Bureau of Standards.

Further results on the heat of absorption of glass: A. Q. TOOL and C. G. EICHLIN, Bureau of Standards.

A recent new system of formulæ for tracing rays through a combination of lenses: JAMES P. C. SOUTHALL, Columbia University.

Notes on lens computation: HERMANN KELLNER, Bausch & Lomb Optical Co.

A new astronomical lens: FRANK E. ROSS, Eastman Kodak Company.

Note on the extended theory of the sectored disk used in photometry (by title): ENOCH KARRER, Bureau of Standards.

Measurements of aberrations of the eye: C. A. PROCTOR and A. AMES, JR., Dartmouth College.

Characteristics of retinal image: A. AMES, JR., and C. A. PROCTOR, Dartmouth College.

Some notes on condenser correction in optical projection (by title): G. W. MOFFIT, Eastman Kodak Company.

The use of the Ulbricht sphere in measuring reflec-

tion and transmission factors (by title): ENOCH KARRER, Bureau of Standards

A comparison of retinoscopic, subjective and finally acceptable ocular corrections: CHARLES SHEARD, American Optical Company.

A new method of joining glass: C. O. FAIRCHILD, Bureau of Standards.

The effect of variations in intensity of illumination of functions of importance to the working eye (by title): C. E. FERREE and G. RAND, Bryn Mawr College.

Optical determination of stress in transparent materials: A. L. KIMBALL, General Electric Co.

The following papers were contributed by the Optical Society to a joint meeting with the American Physical Society:

Photographic reproduction of tone: L. A. JONES, Eastman Kodak Company.

The spectral distribution of energy required to evoke the gray sensation: IRWIN G. PRIEST, Bureau of Standards.

The propagation of light in rotating systems: L. SILBERSTEIN, Eastman Kodak Company.

The next meeting will be held in Rochester in October, 1921. Because of the optical industries centered in and near Rochester and the proximity to universities in which much attention is given to optics, it is expected that this will be a particularly notable and profitable meeting. The program will be announced about the end of September. Titles may be submitted to the secretary at any time prior to that date.

An important feature of the society's work lies in its continuous Committee on Standards and Nomenclature. This committee includes a number of subcommittees dealing with specific fields, such as: colorimetry, photographic materials, photometry, polarimetry, projection, pyrometry, reflectometry, refractometry, spectacle lenses, spectrophotometry, spectroradiometry, visual refraction, visual sensitometry and wave-lengths. Through the work of these committees the society is gradually bringing into being a body of standard data and standard nomenclature which will contribute materially to the progress of science.

The first number of the *Journal of the Optical Society* was issued under date of January, 1917. The publication was designated as "bi-monthly," but during the war the dates of issue were necessarily irregular and the publication discontinuous. Librarians and others will be interested in the following statement of issues. During the calendar years 1917–1919 inclusive there were six separate issues designated as follows:

Vol. I., No. 1, January, 1917.
Vol. I., Nos. 2–3, March-May, 1917.
Vol. I., No. 4, July, 1917.
Vol. I., Nos. 5–6, September-November, 1917.
Vols. II.–III., Nos. 1–2, January,March, 1919.
Vols. II.–III., Nos. 3–6, May-November, 1919.

There were no issues in the calendar year 1918.

Beginning with January, 1920, the size and style of the journal were changed, and it is now issued regularly bi-monthly.

The by-laws state eligibility to membership as follows: "Any person who has, in the opinion of the council, contributed materially to the advancement of optics shall be eligible to regular membership in the society. Any person or corporation interested in optics is eligible to associate membership." Associate members have the same privileges and duties as regular members except that they may not vote nor hold office.

The annual dues are five dollars for both classes of individual members and fifty dollars for corporation members. Dues include subscription to the journal.

Applications for membership should be addressed to Irwin G. Priest, secretary, Optical Society of America, c/o Bureau of Standards, Washington, D. C.

Payment of dues should *not* accompany application. Bill will be sent after action is taken on the application.

Information in regard to the journal may be obtained by addressing Paul D. Foote, editor, *Journal Optical Society of America,* c/o Bureau of Standards, Washington, D. C.

Sample copies of the journal can not be furnished free, but the complete table of contents for 1920 will be mailed free on request

A cordial invitation to become members is extended to all persons who are interested in the purposes and activities of the society.

IRWIN G. PRIEST,
Secretary

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